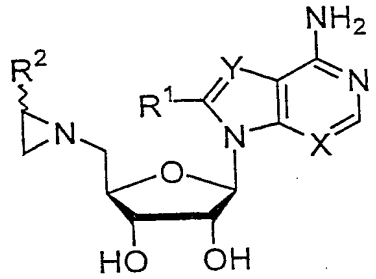
Claims

1. Aziridine derivative represented by formula (I)



(I)

wherein X is N or CH, Y is N or $-CR^3$, R^1 and R^3 independently from each other are H, ^3H, $-NH(CH_2)_nNHR^4$ or $-NH(C_2H_5O)_nC_2H_5NHR^4$, with R^4 being selected from fluorophores, affinity tags, crosslinking agents, chromophors, proteins, peptides, amino acids which may optionally be modified, nucleotides, nucleosides, nucleic acids, carbohydrates, lipids, PEG, transfection reagents, beads and intercalating agents and n being an integer from 1-5000, and R^2 is selected from H, ^3H, $-N(CH_2)_nNHR^4$, $-NH(C_2H_5O)_nC_2H_5NHR^4$ wherein R^4 and n are as defined above, $-CH_2CH(COOH)(NH_2)$ or an electron-withdrawing group.

2. Aziridine derivative of claim 1, wherein X and Y are both N.

3. Aziridine derivative of claim 1, wherein only one of R^1, R^2 and R^3 is $-NH(CH_2)_nNHR^4$ or $-NH(C_2H_5O)_nC_2H_5NHR^4$, the other(s) being H.

4. Aziridine derivative of claim 1, wherein said fluorophore is selected from BODIPY, coumarin, dansyl, fluorescein, mansyl, pyrene, rhodamine, Texas red, TNS, the cyanine fluorophores Cy2, Cy3, Cy3.5, Cy5, Cy5.5 and Cy7, and derivatives thereof.

5. Aziridine derivative of claim 1, wherein said affinity tag is a peptide tag, biotin, digoxygenin or dinitrophenol.

6. Aziridine derivative of claim 5, wherein said peptide tag is his-tag or any tag with metal chelating properties which can be used in IMAC, strep-tag, flag-tag, c-myc-tag, epitopes or glutathione.

7. Aziridine derivative of claim 1, wherein said crosslinking agent is maleimide, iodacetamide, a derivative thereof or an aldehyde derivative, or a photocrosslinking agent.

8. Aziridine derivative of claim 7, wherein said photocrosslinking agent is an arylazide, a diazo compound or a benzophenone compound.

9. A complex of the compound of any one of claims 1 to 8 and a methyltransferase which normally uses S-adenoyl-L-methionine (SAM) as a cofactor.

10. The complex of claim 9, wherein said methyltransferase normally transfers the methyl group of SAM onto a nucleic acid molecule, a polypeptide, a protein, an enzyme or a small molecule.

11. The complex of claim 10, wherein said methyltransferase methylates DNA.

12. The complex of claim 11, wherein said methyltransferase is part of a restriction modification system of a bacterium.

13. The complex of claim 10, wherein said methyltransferase methylates proteins at distinct amino acids.

14. The complex of claim 12, wherein the methyltransferase is selected from the DNA methyltransferases M·*Taq*I and M·*Hha*I.

15. A kit comprising the compound of any one of claim 1 to 8.

16. The kit of claim 15 further comprising a methyltransferase as defined in any one of claims 9 to 14.

17. A kit comprising the complex of any one of claims 9 to 14.

18. A pharmaceutical composition comprising the compound of any one of claims 1 to 8 or the complex of any one of claims 9 to 14 and optionally a pharmaceutically acceptable carrier.

19. A diagnostic composition comprising the compound of any one of claims 1 to 8 or the complex of any one of claims 9 to 14.

20. Use of the compound of any one of claims 1 to 8 for modifying a target molecule.

21. The use of claim 20, wherein the modification of the target molecule is achieved by using the compound of any one of claims 1 to 8 as a cofactor of a methyltransferase which transfers the compound or part of the compound onto the target molecule.

22. The use of claim 20 or 21, wherein the target molecule is a nucleic acid molecule, a polypeptide, a synthetic polymer or a small molecule.

23. The use of claim 22, wherein the nucleic acid molecule is DNA or RNA or hybrids thereof.

24. The use of claim 22, wherein the small molecule is a lipid.

25. The use of claim 22, wherein the polypeptide is a protein or a fusion protein comprising a methylation site.

26. The use of any one of claims 21 to 25 wherein the methyltransferase is a methyltransferase as defined in any one of claims 9 to 14.

27. A method for the preparation of a modified target molecule comprising the incubation of the target molecule with the compound of any one of claims 1 to 8 in the presence of a methyltransferase which is capable of using the compound as a cofactor and under conditions which allow the transfer of the compound or of part of it onto the target molecule.

28. The method of claim 27, wherein the methyltransferase is a methyltransferase as defined in any one of claims 9 to 14.

29. The method of claim 27 or 28, wherein the target molecule is as defined in any one of claims 22 to 25.

30. Modified target molecule obtainable by the method of any of claims 27 to 29.